

1968 PANEL REVIEW OF PHOTOGRAPHS, X-RAY FILMS, DOCUMENTS  
AND OTHER EVIDENCE PERTAINING TO THE FATAL WOUNDING OF  
PRESIDENT JOHN F. KENNEDY ON NOVEMBER 22, 1963 IN DALLAS, TEXAS

At the request of The Honorable Ramsey Clark, Attorney General of the United States, four physicians (hereafter sometimes referred to as The Panel) met in Washington, D. C. on February 26 and 27 to examine various photographs, X-ray films, documents and other evidence pertaining to the death of President Kennedy, and to evaluate their significance in relation to the medical conclusions recorded in the Autopsy Report on the body of President Kennedy signed by Commander J. J. Humes, Medical Corps, United States Navy, Commander J. Thornton Boswell, Medical Corps, United States Navy and Lieutenant Colonel Pierre A. Finck, Medical Corps, United States Army and in the Supplemental Report signed by Commander Humes. These appear in the Warren Commission Report at pages 538 to 545.

The four physicians constituting The Panel were:

- (1) Carnes, William H., M.D., Professor of Pathology, University of Utah, Salt Lake City, Utah, Member of Medical Examiner's Commission, State of Utah, nominated by Dr. J. E. Wallace Sterling, President of Stanford University.
- (2) Fisher, Russell S., M.D., Professor of Forensic Pathology, University of Maryland, and Chief Medical Examiner of the State of Maryland, Baltimore, Maryland, nominated by Dr. Oscar B. Hunter, Jr., President of the College of American Pathologists.

- (3) Morgan, Russell H., M.D., Professor of Radiology, School of Medicine, and Professor of Radiological Science, School of Hygiene and Public Health, The Johns Hopkins University, Baltimore, Maryland, nominated by Dr. Lincoln Gordon, President of The Johns Hopkins University.
- (4) Moritz, Alan R., M.D., Professor of Pathology, Case Western Reserve University, Cleveland, Ohio and former Professor of Forensic Medicine, Harvard University, nominated by Dr. John A. Hannah, President of Michigan State University.

Bruce Bromley, a member of the New York Bar who had been nominated by the President of the American Bar Association and thereafter requested by the Attorney General to act as legal counsel to The Panel was present throughout The Panel's examination of the exhibits and collaborated with The Panel in the preparation of this report.

No one of the undersigned has had any previous connection with prior investigations of, or reports on this matter, and each has acted with complete and unbiased independence free of preconceived views as to the correctness of the medical conclusions reached in the 1963 Autopsy Report and Supplementary Report.

#### Previous Reports

The Autopsy Report stated that X-rays had been made of the entire body of the deceased. The Panel's inventory disclosed X-ray

films of the entire body except for the lower arms, wrists and hands and the lower legs, ankles and feet.

The Autopsy Report also described the decedent's wounds as follows:

"The fatal missile entered the skull above and to the right of the external occipital protuberance. A portion of the projectile traversed the cranial cavity in a posterior-anterior direction (see lateral skull roentgenograms) depositing minute particles along its path. A portion of the projectile made its exit through the parietal bone on the right carrying with it portions of cerebrum, skull and scalp. The two wounds of the skull combined with the force of the missile produced extensive fragmentation of the skull, laceration of the superior sagittal sinus, and of the right cerebral hemisphere.

The other missile entered the right superior posterior thorax above the scapula and traversed the soft tissues of the supra-scapular and the supra-clavicular portions of the base of the right side of the neck. This missile produced contusions of the right apical parietal pleura and of the apical portion of the right upper lobe of the lung. The missile contused the strap muscles of the right side of the neck, damaged the trachea and made its exit through

the anterior surface of the neck. As far as can be ascertained this missile struck no bony structures in its path through the body.

In addition, it is our opinion that the wound of the skull produced such extensive damage to the brain as to preclude the possibility of the deceased surviving this injury."

The medical conclusions of the Warren Commission Report (p.19) concerning President Kennedy's wounds are as follows:

"The nature of the bullet wounds suffered by President Kennedy \* \* \* and the location of the car at the time of the shots establish that the bullets were fired from above and behind the Presidential limousine, striking the President \* \* \* as follows:

President Kennedy was first struck by a bullet which entered at the back of his neck and exited through the lower front portion of his neck, causing a wound which would not necessarily have been lethal. The President was struck a second time by a bullet which entered the right rear portion of his head, causing a massive and fatal wound."

Inventory of Material Examined

Black and white and colored prints and transparencies

Head viewed from above

#5(9JB), 8(7JB), 13(8JB), 16(10JB), 32, 33, 34, 35, 36, 37

Head viewed from right and above to include part of face, neck, shoulder and upper chest

#3(14JB), 4(13JB), 11(6JB), 12(5JB), 26, 27, 28, 40, 41

Head and neck viewed from left side

#6(3JB), 15(4JB), 17(2JB), 18(1JB), 29, 30, 31

Head viewed from behind

#7(16JB), 14(15JB), 42, 43

Cranial cavity with brain removed viewed from above and in front

#1(18JB), 2(17JB), 44, 45

Back of body including neck

#9(11JB), 10(12JB), 38, 39

Brain viewed from above

#50, 51, 52

Brain viewed from below

#46, 47, 48, 49

The black and white and color negatives corresponding to the above were present and there were also seven black and white negatives of the brain without corresponding prints. These were numbered 19 through 25(JTB) and appeared to represent the same views as #46 through 52. All of the above were listed in a memorandum of transfer, located in the National Archives, and dated April 26, 1965.

X-ray films. (The films bore the number 21296 and an inscription indicating that they have been made at the U.S. Naval Hospital, Bethesda, Maryland on 11/22/63.)

Skull, A-P view

#1

Skull, left lateral

#2, 3

Skull, fragments of

#4, 5, 6

Thoraco-lumbar region, A-P view

#7, 11

Chest, A-P view

#9



Right hemithorax, shoulder and upper arm, A-P view  
#8

Left hemithorax, shoulder and upper arm, A-P view  
#10

Pelvis, A-P view  
#13

Lower femurs and knees, A-P view  
#12

Upper legs, A-P view  
#14

#### Bullets

CE 399 - A whole bullet

CE 567 - Portion of nose of a bullet

CE 569 - Portion of base segment of a bullet

CE 840 - 3 fragments of lead

#### Motion picture films

CE 904 - Zapruder film

CE 905 - Nix film

CE 906 - Muchmore film

Series of single frames (215 through 334) from Zapruder film

#### Clothing

CE 393 - Suit coat

CE 394 - Shirt

CE 395 - Neck tie

#### Documents

The Warren Commission's Report and the accompanying volumes of Exhibits and Hearings. (Study of these Documents was limited to those portions deemed pertinent by The Panel.)

Examination of photographs of head

Photographs 7, 14, 42 and 43 show the back of the head, the contours of which have been grossly distorted by extensive fragmentation of the underlying calvarium. There is an elliptical penetrating wound of the scalp situated near the midline and high above the hairline. The position of this wound corresponds to the hole in the skull seen in the lateral X-ray film #2. (See description of X-ray films.) The long axis of this wound corresponds to the long axis of the skull. The wound was judged to be approximately six millimeters wide and fifteen millimeters long. The margin of this wound shows an ill-defined zone of abrasion.

Photographs 5, 8, 13, 16, 32, 33, 34, 35, 36 and 37 show the top of the head with multiple gaping irregularly stellate lacerations of the scalp over the right parietal, temporal and frontal regions.

Photographs 1, 2, 44 and 45 show the frontal region of the skull and a portion of the internal aspect of the back of the skull. Due to lack of contrast of the structures portrayed and lack of clarity of detail in these photographs the only conclusion reached by The Panel from study of this series was that there was no exiting bullet defect in the supra-orbital region of the skull.

Photographs 46, 47, 48 and 49 are of the inferior aspect of the brain and show extensive deformation with laceration and fragmentation of the right cerebral hemisphere. Irregularly shaped areas of contusion with minor loss of cortex are seen on the inferior surface of the first left temporal convolution. The orbital gyri on the left show contusion with some underlying loss of cortex. The sylvian fissure on the right side has been opened revealing a rolled-up mass of arachnoid and blood clot which is dark brown to black in color. The mid-temporal region is depressed and its surface lacerated. The peduncles have been lacerated, probably incident to the removal of the contents from the

cranium.

Photographs 50, 51 and 52 show the superior aspect of the brain. The left cerebral hemisphere is covered by a generally intact arachnoid with evidence of subarachnoid hemorrhage especially over the parietal and frontal gyri and in the sulci. The right cerebral hemisphere is extensively lacerated. It is transected by a broad canal running generally in a postero-anterior direction and to the right of the midline. Much of the roof of this canal is missing as are most of the overlying frontal and parietal gyri. In the central portion of its base there can be seen a gray brown rectangular structure measuring approximately 13 x 20 mm. Its identity cannot be established by The Panel. In addition to the superficial and deep cortical destruction, it can be seen that the corpus callosum is widely torn in the midline.

These findings indicate that the back of the head was struck by a single bullet travelling at high velocity, the major portion of which passed forward through the right cerebral hemisphere, and which produced an explosive type of fragmentation of the skull and laceration of the scalp. The appearance of the entrance wound in the scalp is consistent with its having been produced by a bullet similar to that of exhibit CE 399. The photographs do not disclose where this bullet emerged from the head although those showing the interior of the cranium with the brain removed indicate that it did not emerge from the supra-orbital region. Additional information regarding the course of the bullet is presented in the discussion of the X-ray films.

Examination of photographs of anterior and posterior views of thorax, and anterior, posterior and lateral views of neck (Photographs 3, 4, 6, 9, 10, 11, 12, 15, 17, 18, 26, 27, 28, 29, 30, 31, 38, 39, 40, 41)

There is an elliptical penetrating wound of the skin of the back



located approximately 15 cm. medial to the right acromial process, 5 cm. lateral to the mid-dorsal line and 14 cm. below the right mastoid process. This wound lies approximately 5.5 cm. below a transverse fold in the skin of the neck. This fold can also be seen in a lateral view of the neck which shows an anterior tracheotomy wound. This view makes it possible to compare the levels of these two wounds in relation to that of the horizontal plane of the body.

A well defined zone of discoloration of the edge of the back wound, most pronounced on its upper and outer margins, identifies it as having the characteristics of the entrance wound of a bullet. The wound with its marginal abrasion measures approximately 7 mm. in width by 10 mm. in length. The dimensions of this cutaneous wound are consistent with those of a wound produced by a bullet similar to that which constitutes exhibit CE 399.

At the site of and above the tracheotomy incision in the front of the neck, there can be identified the upper half of the circumference of a circular cutaneous wound the appearance of which is characteristic of that of the exit wound of a bullet. The lower half of this circular wound is obscured by the surgically produced tracheotomy incision which transects it. The center of the circular wound is situated approximately 9 cm. below the transverse fold in the skin of the neck described in a preceding paragraph. This indicates that the bullet which produced the two wounds followed a course downward and to the left in its passage through the body.

#### Examination of X-ray films

The films submitted included: an antero-posterior film of

the skull (#1), two left lateral views of the skull taken in slightly different projections (#2 and 3), three views of a group of three separate bony fragments from the skull (#4, 5 and 6), two antero-posterior views of the thoraco-lumbar region of the trunk (#7 and 11), one antero-posterior view of the right hemithorax, shoulder and upper arm (#8), one antero-posterior view of the chest (#9), one antero-posterior view of the left hemithorax, shoulder and upper arm (#10), one antero-posterior view of the lower femurs and knees (#12), one antero-posterior view of the pelvis (#13) and one antero-posterior view of the upper legs (#14).

Skull: There are multiple fractures of the bones of the calvarium bilaterally. These fractures extend into the base of the skull and involve the floor of the anterior fossa on the right side as well as the middle fossa in the midline. With respect to the right fronto-parietal region of the skull, the traumatic damage is particularly severe with extensive fragmentation of the bony structures from the midline of the frontal bone anteriorly to the vicinity of the posterior margin of the parietal bone behind. Above, the fragmentation extends approximately 25 mm. across the midline to involve adjacent portions of the left parietal bone; below, the changes extend into the right temporal bone. Throughout this region, many of the bony pieces have been displaced outward; several pieces are missing.

Distributed through the right cerebral hemisphere are numerous small, irregular metallic fragments, most of which are less than 1 mm. in maximum dimension. The majority of these fragments lie

anteriorly and superiorly. None can be visualized on the left side of the brain and none below a horizontal plane through the floor of the anterior fossa of the skull.

On one of the lateral films of the skull (#2), a hole measuring approximately 8 mm. in diameter on the outer surface of the skull and as much as 20 mm. on the internal surface can be seen in profile approximately 100 mm. above the external occipital protuberance. The bone of the lower edge of the hole is depressed. Also there is, embedded in the outer table of the skull close to the lower edge of the hole, a large metallic fragment which on the antero-posterior film (#1) lies 25 mm. to the right of the midline. This fragment as seen in the latter film is round and measures 6.5 mm. in diameter. Immediately adjacent to the hole on the internal surface of the skull, there is localized elevation of the soft tissues. Small fragments of bone lie within portions of these tissues and within the hole itself. These changes are consistent with an entrance wound of the skull produced by a bullet similar to that of exhibit CE 399.

The metallic fragments visualized within the right cerebral hemisphere fall into two groups. One group consists of relatively large fragments, more or less randomly distributed. The second group consists of finely divided fragments, distributed in a postero-anterior direction in a region 45 mm. long and 8 mm. wide. As seen on lateral film #2 this formation overlies the position of the coronal suture; its long axis if extended posteriorly passes through the above-mentioned hole. It appears to end anteriorly immediately below the badly fragmented frontal and parietal bones just anterior to the region of the coronal suture.

The foregoing observations indicate that the decedent's head was struck from behind by a single projectile. It entered the occipital region 25 mm. to the right of the midline and 100 mm. above the external occipital protuberance. The projectile fragmented on entering the skull, one major section leaving a trail of fine metallic debris as it passed forward and laterally to explosively fracture the right frontal and parietal bones as it emerged from the head.

In addition to the foregoing, it is noteworthy that there is no evidence of projectile fragments in the left cerebral tissues or in the right cerebral hemisphere below a horizontal plane passing through the floor of the anterior fossa of the skull. Also, although the fractures of the calvarium extend to the left of the midline and into the anterior and middle fossae of the skull, no bony defect such as one created by a projectile either entering or leaving the head is seen in the calvarium to the left of the midline or in the base of the skull. Hence, it is not reasonable to postulate that a projectile passed through the head in a direction other than that described above.

Of further note, when the X-ray films of the skull were presented to The Panel, film #1 had been damaged in two small regions by what appears to be the heat from a spot light. Also, on film #2, a pair of converging pencil lines had been drawn on the film. Neither of these artifacts interfered with the interpretation of the films.



Neck Region: Films #8, 9 and 10 allowed visualization of the lower neck. Subcutaneous emphysema is present just to the right of the cervical spine immediately above the apex of the right lung. Also several small metallic fragments are present in this region. There is no evidence of fracture of either scapula or of the clavicles, or of the ribs or of any of the cervical and thoracic vertebrae.

The foregoing observations indicate that the pathway of the projectile involving the neck was confined to a region to the right of the spine and superior to a plane passing through the upper margin of the right scapula, the apex of the right lung and the right clavicle. Any other pathway would have almost certainly fractured one or more bones of the right shoulder girdle and thorax.

Other Regions Studied: No bullets or fragments of bullets are demonstrated in X-rayed portions of the body other than those described above. On film #13, a small round opaque structure, a little more than 1 mm. in diameter, is visible just to the right of the midline at the level of the first sacral segment of the spine. Its smooth characteristics are not similar to those of the projectile fragments seen in the X-rays of the skull and neck.

#### Examination of the Clothing

Suit Coat (CE 393) A ragged oval hole about 15 mm. long (vertically) is located 5 cm. to the right of the midline in the back of the coat at a point about 12 cm. below the upper edge of the coat collar. A smaller ragged hole which is located near the midline and about 4 cm. below the upper edge of the collar does not overlie any corresponding damage to the shirt or skin and appears to be unrelated to the wounds or their causation.



Shirt (CE 394) A ragged hole about 10 mm. long vertically and corresponding to the first one described in the coat, is located 2.5 cm. to the right of the midline in the back of the shirt at a point 14 cm. below the upper edge of the collar. Two linear holes 15 mm. long are found in the overlapping hems of the front of the shirt in a position corresponding to the place where the knot of the neck tie would normally be.

Tie (CE 395) In the front component of the knot of the tie in the outer layer of fabric a ragged tear about 5 mm. in maximum diameter is located 2.5 cm. below the upper edge of the knot and to the left of the midline.

#### Discussion

The information disclosed by the joint examination of the foregoing exhibits by the members of The Panel supports the following conclusions:

The decedent was wounded by two bullets both of which entered his body from behind.

One bullet struck the back of the decedent's head well above the external occipital protuberance. Based upon the observation that he was leaning forward with his head turned obliquely to the left when this bullet struck, the photographs and X-rays indicate that it came from a site above and slightly to his right. This bullet fragmented after entering the cranium, one major piece of it passing forward and laterally to produce an explosive fracture of the right side of the skull as it emerged from the head.

The absence of metallic fragments in the left cerebral hemisphere or below the level of the frontal fossa on the right side together with the absence of any holes in the skull to the left of the midline or in its base and the absence of any penetrating injury of the left hemisphere eliminate with reasonable certainty the possibility of a projectile having passed through the head in any direction other than from back to front as described in preceding sections of this report.

The other bullet struck the decedent's back at the right side of the base of the neck between the shoulder and spine and emerged from the front of his neck near the midline. The possibility that this bullet might have followed a pathway other than one passing through the site of the tracheotomy wound was considered. No evidence for this was found. There is a track between the two cutaneous wounds as indicated by subcutaneous emphysema and small metallic fragments on the X-rays and the contusion of the apex of the right lung and laceration of the trachea described in the Autopsy Report. In addition any path other than one between the two cutaneous wounds would almost surely have been intercepted by bone and the X-ray films show no bony damage in the thorax or neck.

The possibility that the path of the bullet through the neck might have been more satisfactorily explored by the insertion of a finger or probe was considered. Obviously the cutaneous wound in the back was too small to permit the insertion of a finger. The

insertion of a metal probe would have carried the risk of creating a false passage in part, because of the changed relationship of muscles at the time of autopsy and in part because of the existence of post-mortem rigidity. Although the precise path of the bullet could undoubtedly have been demonstrated by complete dissection of the soft tissue between the two cutaneous wounds, there is no reason to believe that the information disclosed thereby would alter significantly the conclusions expressed in this report.

#### Summary

Examination of the clothing and of the photographs and X-rays taken at autopsy reveal that President Kennedy was struck by two bullets fired from above and behind him, one of which traversed the base of the neck on the right side without striking bone and the other of which entered the skull from behind and exploded its right side.

The photographs and X-rays discussed herein support the above-quoted portions of the original Autopsy Report and the above-quoted medical conclusions of the Warren Commission Report.

William H. Carnes  
William H. Carnes, M.D.

Apr. 9, 1968  
Date

Russell S. Fisher  
Russell S. Fisher, M.D.

Mar. 28, 1968  
Date

Russell H. Morgan  
Russell H. Morgan, M.D.

Mar. 28, 1968  
Date

Alan R. Moritz  
Alan R. Moritz, M.D.

April 6, 1968  
Date